

COST AND MANAGEMENT

PROFIT

**A Case Study in the
Development of an Integrated
Data Processing Application . . .**

By J. M. Otterbein

**Accounting Research
in Canada . . .**

By Calvin C. Potter

**Labour Costs —
Revealed or Concealed? . . .**

By M. P. McBain

LOSS

***Official Journal of
The Society of Industrial and
Cost Accountants of Canada***

SEPT., 1957

Our day-to-day role is that of:—

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- devising and giving effect to better management methods, and
- providing such other advice and help as may enable busy executives to get quicker and better results than would otherwise be possible.

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Cost and Management

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No. 8

A CASE STUDY IN THE DEVELOPMENT OF AN INTEGRATED DATA PROCESSING APPLICATION

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The author, who was appointed Executive Assistant in 1953, is responsible for the work of the Planning Department at the Head Office of North American Life Assurance Company in Toronto. During his 27 years with the company he has gained considerable experience in a number of Head Office departments and in branch office work as a cashier and as an auditor. He is a Fellow of the Life Office Management Institute, a member of S.I.C.A., the Systems and Procedures Association and the American Management Association.

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Mr. McBain is Secretary-Treasurer of Kellogg Company of Canada Ltd., London, Ontario. Having joined the parent company in Battle Creek, Mich., 30 years ago, he has had considerable experience in financial management. A Registered Member and former President of the Society of Industrial and Cost Accountants of Ontario, Mr. McBain has also been active in the Council of the London Chapter for many years.

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Editorial Comment . . .

THE INDUSTRIAL ACCOUNTANT CLAIMS PROFESSIONAL STATUS

In an address delivered before the Illinois Society of Certified Public Accountants on June 7, 1957, Marquis G. Eaton, the 47th President of the Institute of Certified Public Accountants in the United States, presented an excellent statement on "Financial Reporting in a Changing Society"; the speaker stated that "the accounting profession through the Institute has accepted the responsibility of leadership in the incessant search for better methods of financial reporting." Mr. Eaton identifies the accounting profession with the Institute of Certified Public Accountants, which could be an over-simplification based on the fact that the Certified Public Accountants in the United States and the Chartered Accountants and Certified Public Accountants in Canada are usually looked upon by the general public as the representatives of accountancy. In the same address, Mr. Eaton acknowledges "that corporation management have the primary responsibility for their own financial statements." It is, perhaps, worthwhile considering who in corporation management prepares and takes the responsibility for the financial statements. It is the Industrial Accountant. Can he claim participation in the professional status which the Certified Public Accountants in the United States and their counterparts in Canada have achieved in the public mind?

No doubt, the discussion must first centre on what "professional status" really means. We are indebted to the International Association of Torch Clubs for a thorough search for a proper description of what makes a professional man (Leonard C. Kercher "Who Is Eligible for Torch?"—July, 1957 issue of *The Torch*, Volume XXX, No. 3). Apart from the members of listed categories among which the Certified Public Accountants are to be found, a truly professional person has to satisfy the following criteria:

1. Has a recognized professional degree from an accredited school, or an acceptable equivalent in training and experience.
2. Pursues work that requires a mastery of some area of knowledge and skills, an exercise of judgment, and an assumption of individual responsibility rather than the mere carrying out of essentially routine procedures, however specialized.
3. Evidences a sense of obligation of service to his fellow man.
4. Joins with his vocational group in maintaining standards of competence and integrity in professional practice."

Let's see to what extent Registered Industrial Accountants in Canada satisfy these requirements.

1. We could claim that the R.I.A. has a recognized professional degree from an accredited school *and* (not or), an acceptable practical training and experience.

2. The qualified Industrial Accountant's work requires a mastery of accountancy and exercise of judgment in applying "accounting prin-

EDITORIAL COMMENT

ciples"; he has to assume individual responsibility as his superiors and colleagues in general management often lack the necessary knowledge and special background for effective control of his work. The Industrial Accountant participating in setting the course for future action in exercising the prerogatives of managerial accountancy, certainly is beyond the mere carrying out of essentially routine procedures.

3. To the extent to which the Industrial Accountant strives to serve his colleagues in management, his fellow employees in the enterprise for which he works in achieving success, the general public by properly reporting on performance and advising on the best and most efficient course of future action, he evidences an obligation of service to his fellow man beyond the narrow confines of his routine job.

4. There may be little doubt that the R.I.A. has joined with his vocational group, i.e., the Society of Industrial and Cost Accountants in maintaining the standards of competence and integrity in professional practice.

Here, we can merely attempt to present a claim without exploring dealt with by Prof. Kenneth F. Byrd who regards the year 1880 as the year of birth of the accountancy profession in the English-speaking world (The Canadian Chartered Accountant, May, 1954 issue—Volume 64, No. 5). Prof. Byrd differentiates between professional and industrial accounting which he considers both post-graduate fields. To him, apparently, professional accounting is identical with public accounting. It would be a challenging task to dispute this identification of professional and public accounting, but we have to forego this temptation merely to show up the looseness of our terms and insecurity of our semantics.

In the April, 1957 issue of The Accounting Review, Prof. James B. Bower tried to discuss the question "A Profession of Accounting—Or of Accountancy?" In this article, the suggestion is made that "the professional accountant, i.e., one engaged in public accountancy; as certified public accountants are engaged" is too narrow and that "a profession of accountancy should exist if practitioners are to receive full professional recognition and status." "Accountants should work towards the development and recognition of a professional accountancy, with comparable, yet distinctive fields of specialization." Prof. Bower tries to propose that the Controller, the professional executive has professional status, or at least is on the way of establishing such status.

It seems inevitable to us that the professional status of the accountant can not remain confined to the practising public accountant, but that industrial accountants must strive to fulfill increasingly the requisites for professional men and take their rightful place in one of the specialized branches of the all-embracing profession of accountancy.

We are on the way, we can see the goal; let us reach it!

GEORGE MOLLER.

How to
turn the tables
on office
obsolescence



Call the roll of Burroughs adding machines:
The Ten Key (choice of 4 attractive colors).
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choice). And the low-priced Thrifline in
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—and *tomorrow*—in their ultra-quiet
operation. Their perennial accuracy and
dependability. Their smart styling. Their
shadow-touch operation. Their self-repeating
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models—their instant credit balances.

For a convincing free demonstration call
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BURROUGHS ADDING MACHINES



"Burroughs"—Reg. TM.

C. & M. Round-Up . . .

By N. R. BARFOOT

LOOKING AHEAD

Fire Insurance costs will rise. Losses have been much heavier of late due to storm damage coverage. Loss ratios last year rose to new heights, so that an early jump in premiums is indicated. Youthful drivers and those with accidents will be hit heaviest.

Tranquillizers to be used on farms—The wonder drugs apparently are capable of boosting the rate of gain, feed efficiency and carcass quality of steers and lambs.

New Canadian History of 16 volumes will be published beginning in 1959. Some 16 historians from coast to coast will do the work. A balanced presentation of economic, political and cultural factors is the plan.

Foamed aluminium is the latest development in an already active development field. It is ultra light, can be nailed, screwed, and cemented. It is reasonably fire and corrosive proof.

The Canadian Dollar has dropped 25% in purchasing power in the last nine years. Only 15% drop in the same period in the U.S. but 34% in the U.K.



OF GENERAL INTEREST

Low Cost Housing

A major drive is on for a low cost house.

Housing starts are down and won't necessarily be improved by more mortgage money.

Longer loans may help but do not get at the major problem.

The \$3-\$5,000 a year earner has no chance of buying the present \$10,000 home with 3 bedrooms.

Costs continue to rise due mainly to all-round wage increases.

Subsidies are a poor way to correct the situation.

The real problem lies with the builders.

New designs providing at least 925 sq. ft. in a 3 bedroom plan at a price the average wage earner can finance, is needed.

Perhaps the day of the small housebuilder is finished, as the bulk of the trade becomes more production line minded.

In any case, a real push is on to lower the boom on costs.

One particular designer by a combination of original design, new uses of material, pre-fabbed sections and standardized dimensions for all materials, promise to get a liveable 3 bedroom house to the \$8,000 mark.

A sample house will appear this Fall.



Textiles in Canada

In 1950 the industry held 67% of the fabric market. Today it holds only 56%.

Most mills have been forced to operate at marginal or no profit. Main handicap is the production of small amounts of a wide range of products.

COST AND MANAGEMENT

U.S. mills enjoy a lower unit cost due to long runs of one or two items.

Lack of profits in Canadian mills has meant little money available for new equipment.

Long term solutions are (1) new and improved machinery backed by more efficient manufacturing and distribution, (2) the demand for textiles is growing and will more than double in the next 25 years.



Nuclear propulsion offers an exciting new age of transport.

The first nuclear propelled ship was the U.S. submarine Nautilus.

By 1961 both the Americans and British will have cargo ships in the water, using nuclear power plants.

Two super-tankers of 80,000 and 65,000 tonnage will be constructed by U.K. firms.

U.S. navy has a nuclear powered missile cruiser on the drawing boards.

The two largest electrical firms in the U.S. are working on atom engines for locomotives.

General Dynamics Corp., who designed the Nautilus, are working on an atom powered aircraft.

Within a few years nuclear fuel will be cheaper than diesel oil.

Canadians should be especially interested in this development for two reasons:

- By 1958 we will be the world's biggest supplier of uranium.
- Through corporation relationships we have access to the latest know-how in nuclear propulsion. For example, Canadair Ltd., connected with General Dynamics, A. V. Roe Canada Ltd., with Hawker Siddeley of the U.K. and many others.



ON THE PERSONAL SIDE

A house heated by the sun will be on display next year. A world-wide competition is being held to find the best design. Don't rush to throw out your present heating system. Solar energy will probably be used only in those areas where there is a large number of sunny days per year.

Furniture bargains this fall. Many producers already producing next year's designs have warehouses packed with unsold styles.

New cars are already appearing. More horsepower, more decorations, longer, lower, is the trend. Design, while evolutionary rather than revolutionary, will still have that built-in quality of obsolescence, so that at least every 3 years, regardless of mechanical condition, you will feel the need to trade.

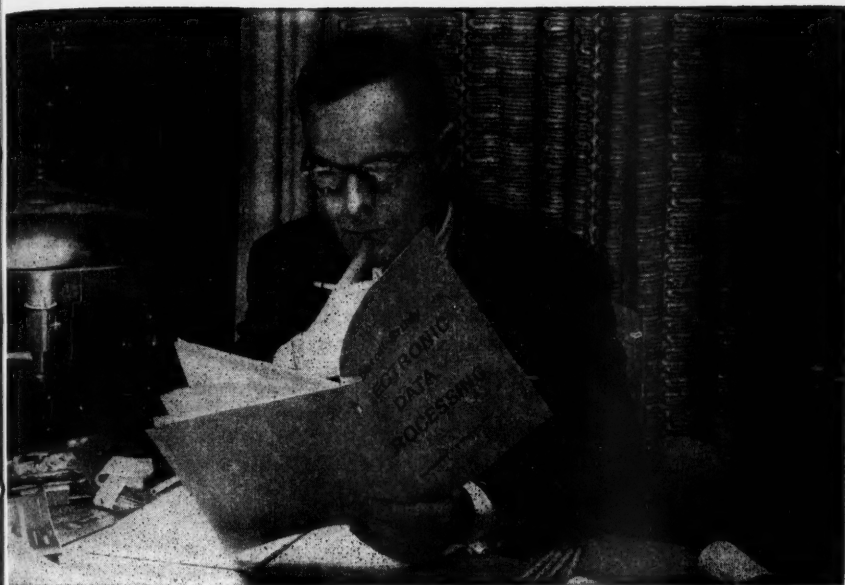
Coronary troubles may be reduced in the future if a new anti-clotting enzyme is successful in humans. It is a development of Yale University and has worked well on animals to date.

Have you a swimming pool? Industry sales are high. The use of new materials, easy to assemble and install, plus credit arrangements has enlarged the market.

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IBM

Your top management wants data processing information . . .

here's how you can help!

Whether or not your company shares in the benefits of electronic data processing may well depend upon you.

As you know, there should be no "snap judgments" on electronics. It takes careful study. But, this effort to gather the facts, re-examine procedures and review management requirements can prove extremely rewarding. The individual nature of your business demands that management know exactly when, where and how electronic data processing can fit your special needs. Whether or not your company decides for electronics, this re-examination of systems and procedures yields vital economies. The important point is that you start now so that these electronic economies are yours sooner.

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For the down-to-earth facts about electronics for business, talk to your local representative or write: International Business Machines Company Limited, Don Mills Rd., Toronto 6.

*During 1955, IBM announced a major data processing improvement every two weeks.

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**DATA
PROCESSING**

COST AND MANAGEMENT

Accurate Steam Costing with KENT ROTARY SHUNT METERS

Find out where
your steam dollars
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When steam is metered to
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Excessive consumption is readily
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WINNIPEG—Mumford, Medland Ltd.
HALIFAX—Purves Industrial Sales

A Case Study in the Development of an Integrated Data Processing Application* . . .

By J. M. OTTERBEIN, F.L.M.I.,
*Executive Assistant,
North American Life Assurance Co.
Toronto, Ontario.*

Rapid growth coupled with a shortage of clerical help had created administration problems for this Group Department of an insurance company. The following case study tells how these problems are being solved through the installation of an integrated data processing system and outlines the various steps taken.

The Integrated Data Processing Concept

BY REFERENCE to the Webster definitions for the individual words, the term I.D.P. might be defined as (1) The union of parts or elements so as to form a complete, rounded out, perfect whole; or (2) Reproducing mechanically data that is common to a series of steps in a "complete, rounded out, perfect whole", to which we would like to add "automatically".

The first definition will be recognized as always having been a prime objective of any office system or department survey. The second has been made possible by the fairly recent developments in "common language" office machines.

It is recognized that within the tabulating department the I.D.P. concept is well established. The "common language" is the punched card produced in the initial step "reproducing data mechanically and automatically" through all subsequent steps.

Now through the medium of the punched paper tape other office machines have been geared to operate from and produce in a "common language" medium. Therefore, it becomes possible to extend automatic reproduction to other departments and to integrate paper handling operations from receipt of raw data to the production of the end result—"the complete, rounded out, perfect whole".

The purpose of this paper is to present the steps followed and some of the benefits derived in the development of an I.D.P. application for group annuity business.

The Problem

The tremendous growth of group business in a period of tight clerical employment had created administration problems. The key personnel became so involved with training new additions and replacements of staff and with the many other problems involved in an effort to provide reasonable service, that there was no opportunity to develop co-ordinated forms or procedures. The system grew like "Topsy".

*Presented by Mr. W. J. Bugar, Comptroller, North American Life Assurance Company, Toronto, at the 1956 Annual Conference of the Life Office Management Association.

COST AND MANAGEMENT

When the survey was started the annuity portion of our group business consisted of approximately 700 cases widely ranging in size and benefits and comprising some 16,000 certificates.

Gathering the Facts

The usual techniques in gathering the facts were followed.: presentation to the department people of the survey objectives, the methods and the analyst involved; review of departmental organization structure, job grades and work relationships; preparation of job descriptions from individual interviews; and so on. This is a tedious, time consuming task but an essential one, if effective simplification and co-ordination is to be achieved.

Charts

The details of existing organization, work division and procedures were graphically depicted in the following charts:

- (a) Organization charts showing job grades, lines of responsibility, etc.
- (b) Work distribution charts
- (c) Flow process charts for the individual jobs
- (d) Flow diagram or multiple flow process charts

Changes Instituted During Fact-Gathering Stage

During the fact-gathering stage, several changes in routines were made where they could be implemented to improve operations without prejudicing any final major revision of procedures; for example, an improved file reference and control system was installed.

Analysis

The first step was to analyse the departmental organization structure and division of work. In studying the organization chart and the work distribution charts it became obvious that the first need was to achieve a better balance. Here "Topsy" had assigned the responsibility for 25 of the 43 clerks to one of three supervisors. Another need was to establish a better functional distribution of work to overcome duplication and overlapping. For example, calculation, billing and accounting work on new cases was done in the issue section. Specialists in the other sections handled these functions on renewals and it appeared that it would be more efficient if the work on new cases was transferred to these specialists. The resulting changes in organization established a new character for what was formerly the issue section and resulted in the physical re-arrangement of the staff with a redistribution of work.

Integration of Forms and Revision of Procedures

All the forms in use were studied for possible integration in order to provide for easier and more effective handling. The most frequently used forms contained common information which led to investigation of the possibility of using one of the "common language" machines.

DEVELOPMENT OF AN I.D.P. APPLICATION

A visit was made to R. L. Crain's I.D.P. Workshop in Ottawa to investigate types and features of the "common language" machines installed there. Following this, procedures were developed on a tentative basis for use with the Programatic Flexowriter. This was purely a "test flight" into the integrated mechanization of the procedures.

Starting with this development, the senior supervisor of the Group Department was relieved of his line duties and teamed up with the planning analyst to work out the integration of the forms and procedures. Frequent conferences were necessary with the operating officer for clearance on major streamlining innovations. It was here that the flow diagram proved valuable in presenting a comprehensive picture of the existing procedures for analysis and of the proposed procedures for consideration. It was plain that a narrative report, no matter how skilfully prepared, would have been quite ineffective by comparison.

Having developed a set of procedures which incorporated the I.D.P. principles, an investigation was made of other equipment in the "common language" field applicable to this type of operation. It appeared that three pieces of equipment might meet the requirements, the Flexowriter, the I.B.M. Cardatype and Underwood's Dataflo.

A sample case was prepared setting forth the requirement for records. The calculation and other steps in the procedure were outlined and submitted to these three machine suppliers with copies of the new forms on the integrated basis. These forms had been prepared from paper multilith masters for testing purposes. The machine representatives were asked to assess the feasibility of our proposed procedures and to make any suggestions necessary or desirable in applying their particular equipment. During this period we proceeded independently to work out variations and refinements in the basic procedures to make the best use of the special features of each machine.

Decision on Machines

It was determined that the Cardatype, although excellent, was not economically feasible for our particular operation.

The Flexowriter and the Dataflo each has features peculiar to itself which makes it necessary to consider carefully the circumstances under which each is to be used.

Dataflo's advantage is its greater production capacity. One data tape can produce up to four different forms or sets of forms simultaneously through the use of the programme control panel and the addition of slave machines. However, the use of Dataflo for preparation of initial data tapes would tie up the large production capacity and in this respect Flexowriter has the advantage.

The production of the four sets of different forms, possible on a simultaneous basis using Dataflo, would involve four programme tapes and an extended series of machine runs on the Flexowriter. The

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Flexowriter has greater flexibility in that the units can be used serially or interchangeably in the various steps.

For our purpose it was decided to install one Flexowriter and one Dataflo unit with two slaves. The preparation of the data tape in the initial step would be done on the Flexowriter, reserving the Dataflo for producing in a simultaneous operation the record cards, cost statements and certificates, (see figure 2) from this tape. The Flexowriter would also be useful for such single document preparations as monthly billings, etc.

Some Advantages Indicated

Reference has already been made to the simultaneous production of forms and this in itself suggests a substantial reduction in the time element.

Of even greater significance is the gain expected in accuracy and work elimination through production and verification of the initial tape, with its subsequent use for automatic reproduction of forms. This means one typing and checking of the policy particulars as compared with four independent typing and checking operations in the old procedure. Conservative estimates indicate that our typing pool will be able to handle a 30% increase in volume with no increase in staff.

In the area of better service, the greater ease of producing clear and accurate records for policyholders and our sales people is a factor of considerable importance.

Control

Under the existing issue system all of the operations are under the supervision of one person. The new system provides for the handling of certain operations concurrently by specialists in other sections. This procedure will necessitate specific control.

A six-part carbon set has been developed for this purpose. The upper portion contains a summary of the application details and this is to be prepared in the Head Office Group Sales Department. Space is provided on the lower portion of each copy for special instructions to the particular section receiving the copy. These special instructions are written on the form by hand.

All copies have perforated slips which must be completed at specified points in the procedure. The slips are forwarded to a production control unit, where the status of the work in process can be constantly watched.

Further Examples of Forms and Procedure Integration

Some of the interesting aspects of the issue procedures are shown in figures 1 and 2. Figure 1 shows the forms in use before integration with the order of information as it appears on the revised forms. Figure 2 shows the proposed forms indicating the integration of information. The record card (Figure 2) contains the basic informa-

DEVELOPMENT OF AN I.D.P. APPLICATION

DEVELOPING
AN I.D.P. APPLICATION

FORMS IN USE BEFORE INTEGRATION

FIGURES INDICATE
ORDER OF INFORMATION
ON THE INTEGRATED
FORMS—SEE FIG. 6.

NORTH AMERICAN LIFE ASSURANCE COMPANY
TORONTO, ONTARIO

No Policy CA- /

Cert. No. 3 Year— 0-

Statement of Retirement Income contemplated by arrangements made on or

For service prior to Registration Date
Former Service Annuity 10
Optional Income Annuity 20

Total: PAY 300000

NORTH AMERICAN LIFE ASSURANCE COMPANY
TORONTO, CANADA

Member

Certificate No. 3

Registration Date 9

Normal Retirement Date 19

Beneficiary 15

15 of the Member

under

GROUP ANNUITY POLICY

NO. GA- 1

Issued to 2

2.1.10 1.10 1.10

FUTURE SERVICE										PAST SERVICE		TOTAL		OPTIONAL	
NAME OF CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

NORTH AMERICAN LIFE ASSURANCE COMPANY
GROUP RETIREMENT PLAN

Name of Employee 3

Name of Employee 9

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

THIS FORM FOR OFFICE USE ONLY

Policy No. 3

Employee's Name

Employee's Address

Employee's Date of Birth

Employee's Date of Death

Employee's Date of Retirement

Employee's Date of Death

Employee's Date of Retirement

Employee's Date of Death

FIGURE 1

DEVELOPING AN I.D.P. APPLICATION

THE FIGURES ON EACH FORM
SHOW THE INTEGRATION OF
INFORMATION. THEY ALSO
INDICATE THE AMOUNT OF
COMMON INFORMATION.

NORTH AMERICAN LIFE ASSURANCE COMPANY			
TORONTO, CANADA			
GROUP ANNUITY POLICY NO.	1	ISSUED TO	2
CERTIFICATE NUMBER	3	MEMBER	4
DATE RECEIVED	5	NORMAL RETIREMENT DATE	6

This is to certify that subject to the terms and provisions of the Group Annuity Policy, the annuity commencing at your normal retirement date will be the amount shown below payable to monthly installments during your lifetime, guaranteed for sixty monthly payments.

Other benefits include: Optional form of retirement annuitant which may be selected in lieu of the retirement annuity. Benefits on termination of employment. Benefits in the event of the death of the annuitant prior to retirement.

This certificate confers no right; it is issued for information only and the certificate bearing the issuance date should be submitted.

Beneficiary	Relationship	Anniversary Date	Total Annual Annuity
12	13	14	8 15

G.D. Cori,
V.P.

President

[illegible]

FIGURE 2

DEVELOPMENT OF AN I.D.P. APPLICATION

tion on the certificateholder. This is obtained from the application card signed by the member at enrolment. The application card will be a two-part form. It will be used as a work sheet for the initial calculation of annuity benefits and costs and will replace a hand-written valuation data sheet now used for key-punching the valuation cards. Later, through the use of a tape-to-card convertor, the manual key-punching and verification can be eliminated.

Preparation of the cost statement has been simplified. The present system involves a hand-written statement and a tedious typing operation requiring many tab stops. The hand-written statement will be eliminated. The typewritten statement will be produced automatically as a by-product of preparing record cards from the punched tape.

A combination of forms will be effected by the use of one form to serve both as the member's statement of annuity and his certificate. The certificate will be renewed every year. This has the advantage of making the renewal procedure the same as the issue, allowing the automatic production of these forms.

Filing of Punched Paper Tapes

Filing of the punched paper tapes presents quite a problem and is the subject of a separate investigation. Reels and envelopes of varying sizes and types are available. Present indications are that the number of changes for individual certificateholders will make individual tapes more feasible than full-length group tapes. We plan to file these tapes in polyethylene envelopes.

Tape filing equipment presently on the market appears to be quite costly. We are continuing to investigate the possibility of adapting filing cabinets or open-shelf filing for storage of these tapes.

Plans for Implementation

Upon delivery of the Flexowriter, the job of preparing tapes for existing certificateholders will be started. It is our present intention to train several persons in the use of this machine in order to provide a good reserve of operators. In preparing these tapes the trained operators can rotate and reduce the monotony of this initial job.

Operators will be trained upon receipt of the Dataflo equipment and it is anticipated that during the less busy summer season the procedures can be tested thoroughly on the equipment and forms. The complete change-over is expected to be made in the early fall of 1957. Even before delivery of the machines, considerable benefit will be derived from using the new integrated forms and routines.

Gaining Effective Staff Acceptance of Change

The vital need for the close co-operation of, and assistance from, all members of the Group Department through the fact-gathering, analysis, and development stages has already been implied or directly referred to. The senior supervisor of the Department was attached to Planning for the eight months during which the facts gathered were

COST AND MANAGEMENT

studied and integration of the procedures, forms and machines was developed, and it is hoped that he can continue his full-time participation in planning through at least part of the period of implementation of the new procedures.

During the planning period and particularly while the investigation of machines and development of procedures was going on, little contact was made with the members of the Department and the feeling grew that they were not being kept in the picture. Just as soon as it was feasible, the proposed procedures were discussed in detail with the heads of the three sections of the Department. It was realized then what a formidable task it would be to explain them in similar detail to the other members of the Department especially if we were to attempt to put across any idea of the system as a whole and the part that each would be playing in it.

Our aim, of course, is to enable everyone to understand the advantages of the new system and to appreciate the scope for individual abilities and job satisfaction. The Public Relations Department was called in to assist us in this task and they proceeded to put the story in visual form through the use of slides. The Department supervisor who had worked with the systems analyst on the development of the new procedures showed the slides to the members of his Department. He used a carefully prepared script to explain the administrative problems as he and they in the Department knew them, the re-organization of the Department and work distribution which they had already seen take place and then described the "New Look" in terms of the machines, forms, steps in the new procedures and the expected results. It was a Group Administration Department show from start to finish.

It was realized that, interesting as the story of the system as a whole would be to the staff, each one would be interested primarily in what would be the effect on his or her own individual job. This was met by giving the supervisors detailed job descriptions based on which they could discuss each one's job in its new form. As the machines will not be installed for some months yet, this discussion of individual jobs with the persons concerned gives each one the opportunity to critically study, question and suggest changes from the standpoint of each one's knowledge and experience—in other words each is enabled to make his contribution or to become personally "involved" in the development of the "final" procedures.

Gaining acceptance of change involves the extremely delicate task of combining leadership from the top and participation from the bottom. A prime consideration is the extent to which the concerned people have themselves contributed because nothing succeeds as well as that which people do for themselves.

Summary

The integration, co-ordination and simplification of all the parts or elements in a system has always been the basic aim in systems and

DEVELOPMENT OF AN I.D.P. APPLICATION

procedures analysis. The new development which extends the scope of improvements and also enlarges the number of steps or elements that should be considered as integral parts of the "whole" is the addition of the "common language" feature to the regular office machines. This makes possible the elimination of much manual repetition of common information. If this application proves successful, it is anticipated that these I.D.P. principles will be extended to most departments as other complete systems are introduced.

Thus, the concept embraced in our opening definition of I.D.P. can become established practice throughout the company—"reproducing mechanically (and automatically) data that is common to a series of steps in a complete, rounded out, perfect whole".

FOR FURTHER READING

INTEGRATED DATA PROCESSING. A Case History, by A. A. Mackay, Canadian Chartered Accountant, March 1957.

PREPARING FOR OFFICE AUTOMATION, by H. W. Rowlands, Cost and Management, February 1957.

INTEGRATED DATA PROCESSING. A Panel Discussion, Cost and Management, January 1957.

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Accounting Research in Canada . . .

By CALVIN C. POTTER, Ph. D., B. Sc. Com., M. Com., C.A.,
Administrator of Research,
Society of Industrial and Cost Accountants.

Research is a valuable method of approach to the scientific study of a subject and a knowledge of what approaches have been tried and their results is very helpful indeed. In this article the author discusses accounting research under three natural headings into which the subject falls, research relating to instruction, interpretation and accounting theory.

IN THE past decade the term "research" has emerged from the sanctuary of the ivory tower and become a familiar part of vocabulary for a great number of people. It denotes fundamentally a method of study. "Research," says the Oxford Dictionary, is "the endeavor to discover facts by the scientific study of a subject." In this regard, the scientific study of a subject, I feel somewhat like M. Jourdain in Molière's "Le Bourgeois Gentilhomme," who was amazed and delighted to discover he had been speaking prose all his life; I'm continually impressed by the extent to which we apply scientific study in the day to day carrying out of our duties. We apply it when we are trying to pass on knowledge by instruction; when we are seeking to interpret the past by analyzing data, and when we are trying to push back the frontiers of knowledge by establishing new relationships. In each of these instances, approach or scientific method adopted is an important concern, and a knowledge of what approaches have been tried and what results obtained is very helpful indeed. So, in discussing Accounting Research it would seem reasonable to discuss it in stages, dealing first with research relating to instruction, then with that concerning interpretation, and finally with that pertaining to accounting theory.

Research Relating to Instruction

Research relating to instruction is concerned with the young man in training today. How can he best be prepared for the responsibilities he will assume in the distant tomorrow? This problem is particularly bewildering in accounting, the profession itself being on the threshold of the biggest revolution in its history. Developments in areas such as integrated data processing, electronic computers, operations research and managerial decision-making are transforming the types of accounting skills and habits required and are laying the base for a major change in the future in the character of relations between accountants and non-accountants. This fluid state of affairs, then, makes it particularly important to predict today what our young men in training will have to cope with in the future and our duty as instructors is to ensure that they are adequately prepared.

In preparing students, the main tool of the educationalist is a pedagogic device, the accounting curriculum. By forcing the student to follow it and explore areas of business problems, and by encouraging

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him through intelligent and imaginative teaching, we try to develop in him desirable attitudes of mind. The curriculum, then, is a sort of conveyer. It is a vehicle for carrying students through time for delivery to predetermined stages of development just as a freight train is a means of carrying goods through space for delivery to predetermined physical places. In the same way that the sequence of cars is important to the efficient operation of the freight train, moreover, so the make-up or sequence of courses in the curriculum is important to its success. If our students are to be delivered promptly and at least cost, the instructors must take into account their goals, abilities and experience, available teaching aids, etc. in drafting the curriculum.

But because of the revolutionary changes occurring in accounting, this drafting entails some basic research. To illustrate what this means and the benefits which can be derived, I'm going to use the "revision of curriculum" project we have been engaged in at the Society of Industrial and Cost Accountants.

Educational Foundation

About five years ago the Society of Industrial and Cost Accountants decided that the effects of the accounting breakthrough, a by-product of the revolutionary forces we mentioned earlier and symbolized by the transformation of accounting from a clerical type service to a professional type, were becoming too complex to be dealt with on an ad hoc basis. What was needed was a comprehensive study which would penetrate the surface and uncover the revolutionary forces governing the rate of transition before a programme of revision for the RIA curriculum could be recommended which would prepare the student for the problems of the new era. Such a project was beyond the scope and facilities of the Society's normal educational programme. So an Educational Foundation was established, financed by voluntary contributions from industry, put under the auspices of McMaster University, and directed by a Board of Trustees appointed by the Society.

The Foundation has been involved in a number of educational activities, such as studying examination procedures and exploring the possibilities of collaboration between accounting bodies on student training in its early stages. But the major project has been the study of the RIA curriculum in the light of changing business needs.

The R.I.A. Curriculum

It is always advisable to start with what you have. We started with the present educational programme of the Society. Its objective, we deduced, was to produce good accounting professionals: individuals whose skills, habits, understandings, and attitudes enabled them to think critically and independently about problems of business life. The scope and sequence of the present curriculum, we concluded, were moulded by these aims.

ACCOUNTING RESEARCH IN CANADA

To achieve its objectives, the curriculum incorporated two parallel and concurrent course streams. To develop specialist skills and habits there was an accounting stream. Accounting I, introduced the student to the techniques of recording data and preparing financial statements. In second year, Accounting II continued to practise the student in accounting skills and habits by enlarging his knowledge of procedures and training him in more mature matters such as the presentation and interpretation of financial results. The third year developed new accounting skills and habits in the student by training him in the essentials of cost accounting; while the fourth year was devoted to training him in the uses of accounting as a managerial tool. So that for four arduous years the student is continually practising accounting skills and acquiring accounting habits.

But specialization is a hazard. Specialists tend to judge good and evil, right and wrong, by the sole standard of their specialty. This we try to avoid by orienting the students to the economic scene. We seek, by widening their understanding and cultivating in them appropriate attitudes, to train them to think in terms of over-all effects. To this end the curriculum contains a second course stream of "related knowledge" subjects.

These courses are taken concurrently with the specialist subjects. Along with Accounting I the student takes Business Mathematics to improve his facility in the manipulation of quantitative problems and to develop his reasoning faculties. Along with Accounting II he takes Industrial Legislation to acquaint him with the legal framework within which the business process is carried on. In the third year accompanying the Fundamentals of Cost he takes a course in Industrial Organization and Management to acquaint him with the problems of direction, control, and coordination in a business enterprise. Finally, in the last year, to ensure that the two streams have been joined and harnessed by the student, he has to write a thesis on some aspect of industrial accounting.

The R.I.A. Student

The curriculum we have just described is broadly conceived. But to be effective, it must also be appropriate for current business needs. Before we can decide about this aspect however, we need more information. We need, for instance, a detailed picture of our student body, showing where they are going, their abilities and experience, and their present work places. We also need supplementary information about the trends in their work places, and how such trends might alter student destinations in the future.

To get this picture, we used analysis and sampling. We were surprised by some of the results. We found, for example, that although the ages of our students ranged from 18 to 64, the average age of our first year student was 27. Even more impressive was the fact that 45%

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of them were between 25 and 34, and that over 60% of them had passed what the insurance companies regard as the threshold of maturity—age 25.

Age, of course, is just one of the facets of our student mix. Other important elements are educational qualifications and successful business experience. In these regards also we were equally impressed.

Consider education for instance. By our charter, as you may know, we have to keep an open door in respect to formal education. We have in effect been cast in the role of a second chance institution, and all over 16 years of age who seek entrance have to be considered. Consequently you would expect an assortment of formal educational attainments. But we found that the range of this assortment has been progressively narrowing, those possessing less than junior matriculation standing dwindling from 29% in 1952 to 15% of the student body in 1955. In that year, those with junior matriculation standing constituted 44%; senior matriculants 31%, and university graduates 10%. So that although the assortment is dwindling, our student body, nevertheless, is a varied mixture in terms of education.

On top of this age and educational diversity is a variety of occupational experiences. A matriculant graduates at around ages 17-18, and since the age of our representative student is 27, obviously students have had nine or ten years of business experience. And in those years they have made varying degrees of progress. We found for instance that 20% of our students have already attained supervisory positions in business before starting our course. Another 15% we found were already performing in their work life as bookkeepers and cashiers. Another 55% are in clerical categories such as cost clerk, office clerk, etc. Interestingly, only 8% fall into the category 'miscellaneous'.

About the only thing all of our students possess in common, we concluded, is the state of adulthood.

Testing the R.I.A. Curriculum

Having amassed some data about our student body, we considered the next step. We wanted to test the assumptions of the RIA curriculum. Did, we ask ourselves, the two stream sequence of the curriculum deliver the student promptly and at least cost to selected stages? We suspected it didn't for already danger signals were flying. Business Mathematics, because of its decimating effects, was causing much anxious discussion in the meetings of our educational committee. So we started our test of assumptions with Business Mathematics.

This course, we decided, was premised upon two basic assumptions: (a) that it would bridge the gap in general education which otherwise would exist between those students who had attended university and those who possessed junior matriculant standing or less; and (b) that

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it would contribute directly to proficiency in the handling of financial and statistical formulae in the later stages of training. Our tests indicated that neither assumption had much validity.

Naturally we pondered the implications of this conclusion for some time, for we realized that the place of mathematics on an accounting curriculum has been established by long tradition. Its qualities are regarded as the best basis for developing the intellect. For such training to be of greatest benefit to accountants, of course, it should deal with those facets which the accountant will have greatest occasion to use thereafter—compound and simple interest, percentages, annuities, trade discounts, arithmetical and geometrical progressions, etc.

This very emphasis we felt might be the kernel of the problem. Because of the nature of its practical applications, Business Mathematics seems to be unduly difficult for the stage at which it is taken. Convinced of this by statistical evidence, we sought a more appropriate sequence for the curriculum. After prolonged discussion in the committee, we concluded that since the theoretical aspect of mathematics is really part of general education, it should be omitted from the curriculum.

But the course could not be totally dispensed with, since it is the means of controlling the intellectual mix of students. So although it is to be deleted from the curriculum, we will continue to offer it as a half course to be taken in the summer, and it will be a preliminary requirement for all students who do not possess their secondary school graduation certificate.

Having deleted the theoretical, we then were left with the decision what to do with the practical aspects of Business Mathematics. It is to be transferred, decided the Educational Committee, to a later stage of the course stream and called Managerial Statistics. As such it will be a non-mathematical course dealing with the accounting and managerial applications of statistics. Several members of the committee have serious doubts as to the wisdom of this move, of including a mandatory course in Managerial Statistics without requiring all students to take and pass a course in theoretical mathematics. So this new sequence will be carefully watched and judged in the light of experience.

In this discussion of Business Mathematics we have been dealing with the problem of carrying our students through their stages of development as promptly and effortlessly as possible. There is another aspect to testing the curriculum. It relates to the stages of development to which the curriculum delivers the student. Have these stages kept pace with the dynamic business needs they service so that they are in the centre of developments, or have they been so outpaced that they now lead into fringe areas? To answer our query requires some

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standards of current business needs, and we derived these standards from our periodical, *Cost and Management*.

Assuming that the contributors to the magazine represent the leaders in accounting thought and that the topics they choose reflect the areas of greatest professional concern, we charted the articles against the year in which their principal topic is specifically dealt with in our lesson notes. The result was revealing: of the thirty-one articles published in the magazine in 1955, the principal topic of eleven was not covered in any of our lesson notes. The implication herein, of course, was that our curriculum was not as market oriented as it should be, the syllabus stages have been outpaced by accounting trends.

Accounting trends are most pronounced, as you are all aware, in the area of accounting systems, the methods of which are being drastically revised due to forces such as the transfer of costs from the factory floor to the office, the ever rising cost of clerical help, and the increasing opportunities to process data swiftly by using mechanical aids. In response to such forces, office staff functions are being increasingly reorganized into two broad categories: highly trained accounting executives and semi-skilled clerks. As such reorganization spreads, we foresee a time when it will be unusual to encounter highly skilled clerks in offices. As a corollary, of course, accounting routines will be broken down until they can be done by intelligent people after a short training. Accepting these implications, the problem is, then, to design a curriculum that will prepare industrial accountants for the office transition which lies ahead. What is required is a curriculum which not only develops the traditional skills and habits of accountants, but one which, in addition, prepares the student to exploit the accounting breakthrough in the area of administration by leaving him reasonably conversant with office methods and routines, and with their implications in terms of costs.

What was required, then, was more attention to accounting systems and internal control. Fortunately, room for additional professional instruction had been made when we relegated Business Mathematics to a preliminary requirement. Thus after rearrangement of the course sequences, we could introduce another course in the specialist streams, to be called Accounting III and given in the third year. This course, which is going to be co-ordinated with a revised Accounting II course, will deal primarily with administrative accounting.

By these revisions and additions, the Society has ensured that the RIA curriculum trains students to deal with contemporary accounting problems. But we must also be constantly on the alert for the implication of present economic trends in terms of future accounting problems.

Two accounting problems, associated with the accelerated rate of capital investment in industry and the increased concentration of

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output, loom increasingly large on the horizon. They both have great implications for RIA students, since our students are drawn in large measure from those very industries which are affected most positively by the relevant economic trends—those industries in which, for instance, the substitution of capital, by mechanization, for labour is most rapid. Such substitution has accounting implications in that what was previously a variable cost, direct labour, is converted into a fixed cost, plant and equipment. The corollary of this, furthermore, is a rise in the break-even point with a corresponding swell in the cost of idle plant. From a managerial point of view, then, such conversion, although efficient and necessary, is burdensome, since added fixed costs make it harder to cut losses.

Accordingly, because of increased risk, management before and after decisions will want more thorough analyses. Top management, since it is responsible for policy and is judged by the efficiency of investments, will commonly demand what is already a feature of more progressive firms—return on investment analyses, showing profit by lines and by cost centres. Middle management and below, on the other hand, since they are responsible for carrying out policy and are judged on the basis of operational efficiency, will want reports pinpointing weaknesses in the day to day running of cost-centres, departments, and divisions. They will want reports on equipment usage, for example, showing the cost of slow time and of down-time. For the latter, in addition, they will want analyses pointing to the cause: delays of material supplies, poor quality of material, labour trouble, lack of orders, mechanical breakdown, etc. The accounting implication of capital investment, then, is that the graduates of the future will be making greater use of management accounting, a trend for which we have already provided in our revised Advanced Cost course of 1955.

The implication for accounting of the concentration of output is even more far reaching. Again it is a case of our students being drawn largely from those very industries in the vanguard of this trend, a trend closely related to the volume of sales. For the six industries with which we are concerned, because together they furnish 40% of our students, the average volume of sales per firm is staggering, ranging from \$50,000,000 in the case of petro-coal firms to \$10,000,000 for textile firms, with the average sales volume per firm in the other four industries falling between 15 and 30 millions. With such volume, firms must have elaborate accounting systems to record and control operations.

Obviously, running such an accounting system is a large scale clerical operation. Because of the scale of the firm's operations, moreover, management is heavily dependent upon the accounting system for obtaining information promptly and in suitable form. The size of the clerical staff required as a consequence is so large that the cost of the accounting system itself becomes relevant.

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In a profit economy such a situation inevitably attracts a squeeze as management seeks less costly methods of achieving comparable results. In this regard, statistics show great promise. By applying statistical techniques, the cost of data processing can be reduced, or for the same cost, controls can be improved. Firms, accordingly, are making increased use of statistical techniques in analysing standard cost variances and effecting material and inventory controls. We are very concerned, therefore, that our students should be conversant with the capabilities of these techniques, although we are not anxious that they become statisticians. So a new unit has been added in the fourth year of the curriculum and half of this unit is to be a non-mathematical course in statistics, entitled Managerial Statistics.

The other half is another new course, Report Writing. Many instructors would agree that inability to communicate findings and recommendations in appropriate, concise, and lucid terms is one of the greatest handicaps of students today; many students, moreover, are fully aware of this deficiency. The consequence is continually apparent in internal accounting reports, in business letters, and upon occasion, in accounting articles. The effects are equally visible in the difficulty some of our students have in clearing their last hurdle, the thesis.

I have dealt at length with the research which has been undertaken with regard to the student. But there are also other areas of research as we noted at the beginning of this paper, namely, research relating to present accounting practices, and pure accounting research.

Research on Present Accounting Practices

Conceptually, the two areas of research which remain to be discussed employ methods which are diametrical opposites. The research relating to present practices uses the inductive method of analysis while pure research resorts to the deductive method. Accordingly one type of research requires an extensive contact with and access to the procedures and methods adopted in actual practice while the other requires a particular kind of background training, experience, and intellectual interest. It is not surprising therefore to find the inductive or item by item approach largely identified with the professional associations and the deductive or theoretical approach identified with university professors.

Since the inductive research is mostly carried on by committees of the professional association, any findings receive widespread publicity. We are all familiar, for instance, with the bulletins put out by the Committee on Accounting and Auditing Research of the Canadian Institute. A number of different items have received the attention of this committee, such items as the standards of disclosure, the treatment of income taxes, the responsibility of the auditor for the validity of the inventory figure, the use of the term 'surplus', and

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so forth. What these bulletins do in effect is stamp as "generally acceptable" certain practices which have proved to be useful. These pronouncements are not authoritative enough to be referred to as principles, but having been tested by the consensus of opinion in public practice, they serve as "rules of the road" for the guidance of prudent accountants.

Research Relating to the Theory of Accounting

Research relating to the theory of accounting by its nature is peculiarly fitted to professors. Yet, strangely, few books of highest calibre have been published, here or elsewhere. Why there should be this dearth of sound scientific research attitudes in the area of accounting is puzzling. Certainly there is the need for it—a crying need—for one of the roles of the scholar is to enlarge and enrich the interpretations of the practitioner, and this can only be achieved by a systematic identification of assumptions and questioning of conclusions. In fact, it is difficult to imagine how, without this rigorous effort to separate the fallacious and expedient from the true and enduring, the glowing prospects of the accounting profession can be regarded as assured.

Happily, professional accountants are aware of this state so that the future isn't so sombre. The Canadian Tax Foundation offers, or at least used to offer a fellowship for the purpose of aiding the completion of graduate work in law, taxation or accounting. The Ontario Institute this year for the first time has offered research grants to members of the faculties of Ontario universities to aid them in their summer research. The Canadian Institute, through its Research Committee has sponsored the publication of a book on the principles of accounting for the oil industry, and I understand it is sponsoring another one on the lumbering industry which is about to be published. All of this is evidence of a growing interest in the research of university staffs.

Now, premising that university professors are going to enjoy more adequate funds in the future to sustain their research interests, what type of deductive research should they be undertaking? The options can be broadly categorized under three headings: historical analysis, accounting theory of income and related problems, and National Income Accounting. These are all fertile areas which will bounteously reward attention, but in my opinion prompt attention should first be given to the theory of income. This is the area where findings would have immediate practical value to the profession. Moreover, insofar as these findings reconcile economic and accounting interpretations, they will tend to eliminate much of the tampering with accounting data which is now necessary in National Income Accounting. For, as Prof. Kuznets has pointed out, "economists have to disregard orthodox accounting rules whenever they diverge from the canons suggested by

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the theoretical basis of national income measurement", and this theoretical basis is rooted in economic theory.

Accepting the proposition, then, that academic research should tackle first the matter of income and related problems, what kind of practical results could be expected? In my opinion, meaningful co-operative relations would be further fostered between accountants in universities and those in industry and in public practice.

Consider, for instance, the kind of support and guidance needed by accountants in industry. In the future, I'm sure, they are going to find their position as purveyors of decision-making data put more and more in jeopardy by economists. Economists are venturing into the business stream, and their newly evolved techniques of 'systematic conjecture' and 'genuine prediction' have much to contribute in clarifying managerial decision-making. In this regard accountants have only one alternative to being revamped. It is to join the economists and learn a little about the theory of games and linear programming, since these concepts will be winning many converts in the future.

But in his enthusiasm in his new role, the economist tends to transfer concepts to areas for which they are inappropriate. Take the case of the measurement of income. On an overall basis, in assessing the capacity of a community to sustain its way of life and provide a little margin for improvement in the future, the concept of real income is very appropriate. But people now try to apply this same concept to the affairs of a firm, premising that no real income has been earned until all the economic assets have been restored to their original state. This is the premise made for the measurement of income by the replacement school of depreciation.

While the logic of the school is impeccable, the premise from which it flows is unrealistic. The premise ignores completely the maze of financial relationships which arise in a firm because of the institution of credit. The effect, then, when there are such relationships occurring through a period of changing price levels is to conceal the redistribution of equities in the firm arising from changes in the price level.

There is another aspect, too, to the replacement school approach. It tends to confuse depreciation with the problem of financing. There is general agreement amongst accountants that depreciation is an allocation of costs. If there are no changes of prices and no changes of size and type of plant, the replacement and cost methods produce an identical result in terms of cost. Financing, on the other hand, is an entirely separate operation, the funds being furnished from retained earnings, new equities, or present earnings. What the replacement school argues is that the financing should be furnished by current revenues. This proposal of course raises important questions of taxation and price regulation. If these questions aren't settled accordingly, the

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whole distinction between historical and replacement costs becomes pedantic. But the questions also pose issues of equity between taxpayers, and in the utility field, at least, equity between successive generations of consumers. Obviously these are issues of public policy. Properly speaking, then, the matter is not an issue of depreciation, it is a question of the timing and financing of capital accumulation. In ferreting out these implications, and communicating them to their brethren in industry in a language they understand, the academic accountant is ideally placed in terms of experience, access to research facilities, and background training.

Similarly the academic can be of aid to members of the profession in public practice. The theory of income furnishes an illustration. In the measurement of income there are two fundamental approaches: the Single Account System and the Double Account System, the contemporary concept of measuring income—the matching of costs—being a mixture of the two. Each approach is based upon a set of assumptions. The Single Account System, for instance, premises an impermanent entity dealing in a totally unrestricted market and possessing perfect freedom to invest its resources as it sees fit. In this system, therefore, owing to great uncertainty, the assets of the balance sheet are valued on a going concern basis, i.e., at that price which a willing purchaser will pay.

In the Double Account System, on the other hand, the premises are almost the contrary. In contrast to the SAS, it premises a permanent entity the pricing for which is subject to regulation and the investing of whose resources must be in accordance with the requirements of statute law. In this system, therefore, since permanency makes speculation regarding the value of fixed assets superfluous, the assets of the balance sheet are carried at cost. A pertinent objective of public policy, however, is that the funds raised from the public are invested in authorized objects. Thus it was required that the monies invested in fixed assets should be carried permanently in the accounts, and that the balances of these accounts should be shown in a separate section of the balance sheet, the Capital Account, opposite the accounts showing the capital authorized and raised.

Both of these systems were in common use 75 years ago, the SAS being used by partnerships and limited companies, and the DAS by parliamentary companies. But since that time practice has altered. The accounting profession has formulated the assumption of realization (the premise for the matching process), which is probably the greatest innovation in accounting theory since the Venetians integrated the general journal into the sequence of the accounting cycle. By applying this assumption to the SAS, vexing problems such as unrealized gains which are not available for distribution just evaporate.

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Unfortunately, however, the logic of these alternative methods has been allowed to become very tarnished, so that today many holders of accounting certificates cannot distinguish between the two approaches. In these circumstances it is almost inevitable that an inappropriate approach is applied in a particular instance. This, for instance, is precisely what has happened in the case of the C.B.C.

Amongst numerous other recommendations, the Royal Commission on Broadcasting suggested that the C.B.C. should alter the basis for presentation of its financial accounts. Instead of using the conventional commercial presentation, the assumptions of which are inappropriate, the Corporation, the Commission suggested, should adopt the Double Account System. In the Capital Account section of the balance sheet would be shown the amounts advanced by the government and the investment of these funds in broadcasting equipment—such funds should be regarded as permanently invested with no thought of subsequent recovery. The corollary of this, of course, would be that in the Revenue and Expenditure statement depreciation would not be a deduction but merely a memorandum entry. Thus it has taken over twenty years to realize that the C.B.C. was employing an inappropriate concept. Possibly this long time lag could have been considerably shortened if there had existed a more productive relationship between the teaching and practising segments of the profession.

How can a more productive relationship be created? By a greater use of co-operative research. At present it is as though the profession were split by a stream. On one bank we have the industrial and public accountants. This group by the very nature of their professional activities is likely to first uncover the baffling problems of accounting practice. On the other bank we have the accounting professors. They by training, inclination and experience are well equipped to successfully clarify the nature of baffling problems. What remains to be provided is a bridge, co-operation, so that experience and explanation have easy access to opposite sides.

FOR FURTHER READING

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- RESEARCH IN ACCOUNTING, by Mary E. Murphy, *Chartered Accountant in Australia*, July 1954.

Labour Costs - Revealed or Concealed? . . .

By M. P. McBAIN, R.I.A.,
Secretary-Treasurer,
Kellogg Company of Canada Limited,
London, Ontario.

One of the concerns of the accountant is to keep his operation flexible in the face of changing business conditions. The author urges review of today's situation with respect to labour costs which may often be concealed in other elements of cost and stresses the need of having labour costs fully reflected for management decision.

IT IS my belief that there are very few, if any, new principles being developed in accounting today. We have some new tools to use and accountants and management are gradually broadening their concept of the application of the old principles but it is the application, rather than the principle, which is changing.

Hence, the accountant's problem is one of constant review of his system, not with a view to installing a new system, but to keep his operation flexible to meet new developments in the business itself. Some of these developments are so gradual that we do not realize they are taking place until they have become quite well established.

And so I do not propose to offer a startling new system to cover some phase of your accounting requirements but rather to direct your thoughts to analysis of today's situation in the labour portion of your company's costs.

Development of Labour

In order to discuss our subject intelligently it might be advisable to define labour in the light of our terms of reference. For this purpose labour may be defined as "the energy expended by men and women in the production and distribution of goods and services".

Consideration of labour is further confused by what we call "division of labour". This simply consists of separating the elements of a task and distributing these elements among several persons so that each performs those operations or activities which he can do best.

Each man initially performed all of the labour himself to provide his entire needs: food, raiment, shelter and, if there were any time left, entertainment. As it became obvious that some could turn out superior shoes with less effort, while others seemed to excel at housebuilding or the growing of food, cooperation was developed so that each could devote his full time to the work he could do best and most happily and thus everyone was able to improve his meagre living through division of labour. And, as we know, more leisure time became available for the enjoyment of entertainment, etc.

Before division of labour each man received all of the rewards from his labour since he was producing entirely for his own consump-

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tion. Since a pair of shoes requires a different expenditure of time, energy, and skill than building a house, some common denominator became necessary in order to measure the value of each man's labour when division was arranged, so that there could be a proper distribution of the rewards for the total production.

Of course, rewards consist of money, goods, or privileges such as lodging, share of crops, or what we now call fringe benefits. Now this brings me to my subject. For it is not my purpose to suggest a particular cut and dried system for accomplishing full revelation of labour costs but rather to pose the question to you in the hope that you will consider its merits and application to your own particular situation.

I should like to point out that any opinions expressed here do not necessarily reflect the policy of my employer nor the practice of our company. Also, if you get the impression that I may have some antipathy toward labour—particularly organized labour, this is not true. Actually I feel it is important to the welfare of organized labour to have management fully informed of the facts, for managements sometimes resist labour's demands because of misinformation about costs.

Labour Costs All-Embracing

Many of us need to be reminded frequently that, generally speaking, all costs are labour costs. While a given industry or operation may show that factory labour represents, let us say, 25% of factory cost, this represents only the labour expended in that one factory and does not include the labour component of all of the purchased goods and services.

For example, corn represents a sizable portion of our cost. The farmer sells his corn to obtain what he usually considers to be a highly inadequate rate of remuneration for his work. In his costs are included cost of equipment and, perhaps, interest on investment, either his own or borrowed. This investment represents his savings from earlier labour and, therefore, the earnings are merely deferred wages. Equipment was manufactured with someone's labour and the ore from which the steel, etc. was produced, while provided by Nature, was mined by labour and the mineral rights paid for from someone's savings.

Freight to transport the corn involves chiefly labour and equipment, which is again labour.

And, by this same logic, OUR equipment is all labour as well.

Incidentally, TAXES are used to pay for personal services of people and would be classed as labour regardless of your opinion as to the amount and effectiveness of the labour some of these political recipients actually perform.

In these days when we are all so interdependent, one with another, labour must have relatively equal value per unit of productivity no

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matter where it may have been performed if we are not to have a group of second-class citizens. And the tendency of men to find work where they are better paid will usually force a degree of equality in rates. Hence, an upward adjustment in the real labour rate per unit of production anywhere in our economy must produce a chain reaction which will result in a like increase in every element of production as every person demands, and obtains, his relative adjustment.

Hourly rates increased in recognition of added productivity should not have this result. And, of course, discrimination such as that presently suffered by persons retired on pensions or dependent on other types of fixed income will hold down the effect somewhat.

At one time our company showed in its operating statements under the caption of labour only that labour involved directly in handling the product. That is, the labour cost which theoretically varied directly in proportion to the volume of production. Eventually our President asked for more information and we began to show on some total statements the cost of factory indirect labour as well. As a result, out of every dollar spent by us to obtain the efforts of men and women for the production and distribution of goods and services we now show 62c as labour. Actually the remaining 38c is lumped in when reporting total operations to shareholders but not in our detailed statements to management. I am not suggesting that our cost accountants are not aware of these charges, for allowance is included for these items in any estimates and standard unit costs, but not shown specifically as labour.

Labour Costs Often Concealed

My proposition is that it is not sufficient to know that such costs do exist but that they should be so reflected that they cannot easily be overlooked by any level of management when making decisions or checking efficiency of operations.

Maybe I should give you a clue as to where more properly revealed labour costs might serve a useful purpose before proceeding further with discussion of the various elements which may be concealed.

Fringe benefits and other indirect costs connected with labour are usually allocated to individual operations or products on some percentage basis related to direct labour dollars or hours, machine time, etc. Thus in considering the relative merits of two operations the costs as recorded might show total costs of these indirect items in the same relationship as direct labour.

For example if one operation required seven men at \$1.80 per hour and another required 10 women at \$1.20 per hour the direct labour cost would be respectively \$12.60 and \$12.00. With percentage allocation of fringe benefits, total direct labour and fringe benefits might

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be \$20.16 and \$19.20 so that item number two would be 96c per hour cheaper.

However, analysis may prove that two-thirds of these fringe costs are the same for any employee. Distributing this portion on the proper basis would then result in costs for operation number one of \$19.51 and \$20.17 for number two or a *higher* cost of 66c per hour for number two.

This is just one example of how labour costs can be concealed in our costs.

There are other factors which affect costs of various operations but which cannot be so easily illustrated. For example: The men in operation number one might be senior men by nature of the experience required for their operations and thus entitled to longer annual vacation than the women in operation two where greater turnover could be expected. However, this turnover can produce high employment costs too.

Lumping rights of various groups under labour contracts might have a bearing on this situation too.

Some of these factors can only be properly considered by special analysis of each case outside the ledger records. Now let us look at the *nature* of some of these fringe costs, but before we start our enumeration let us remind ourselves that whatever labour cost we arrange for one group is also ultimately reflected in costs for other groups of employees. For example, increased rates for hourly-rated employees must be given, either directly or indirectly, to salaried employees or soon we may find that no one aspires to training for salaried positions and we have to resort to various means to induce students to train for these vocations. And the same applies to fringe benefits.

Nature of Fringe Costs

Of course, the very first element of labour costs is the expense of the employment office. This first cost is more connected with employees you do NOT have, so that it could be avoided by always retaining your employees and never expanding. However, more and more activities have arisen for the employment or personnel offices just to retain present employees over and above the office functions connected with benefits yet to be mentioned. At any rate, growth in the number of employees inevitably results in growth of the personnel department.

With about 600 factory employees we found locker keys presented a problem. At first a deposit of 25c was charged for every key but no proper set-up was provided for control. So the man responsible just handled the fund through his personal bank account. However, the amount per key was so small that many employees did not return their keys so we could find no basis for checking. Now the deposit is \$1.00 and we have a sizeable fund to control. Someone

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in our accounting department had set up a card record which consumed a great deal of time in posting and balancing. Furthermore, the personnel staff had to do a lot of running to the office for refunds. We simplified this by making a large ring on which all unassigned keys are kept. We credited all deposits received to a special account so that the total dollars in the account plus the number of keys on the ring at all times equals the total number of lockers. Then we set up an imprest fund of keys and dollars in the personnel department so that they only visit the office when the keys or dollars need replenishing. This retained full control while materially reducing the cost—but the operation *still* costs something.

Employees who are furnished work clothing and laundry service involve a real cost which relates directly to the number of employees rather than the hourly rate. Cost of space and staff to handle stocks of clothing and assembly of laundry are also an item.

And those smoke, rest, and lunch periods are fringe benefits for they add to the total cost of the hours actually worked. These are affected by the hourly rates.

Vacation Pay may be computed in terms of normal week's pay or a percentage of previous year's earnings but either relates to hourly rates. It probably will run around 4% of total payroll or 6c per hour on an average rate of \$1.50. For firms allowing eight holidays per year *this* item will add about 4½c per hour.

I need only mention cafeteria loss to bring a grimace to many faces. This relates more or less to the number of employees.

Recreation and entertainment are items which tend to increase with the number of employees.

Health services such as first aid, nurses, doctors, safety directors, etc. will also tend to vary with the number of employees.

Workmen's Compensation is computed on the basis of earnings, i.e. rates of pay, up to a ceiling. A fair amount of clerical work is involved here.

Unemployment Insurance involves rate classifications, subject to a ceiling. Here I might describe our latest effort to reduce clerical cost on this item. This system was very readily approved by the Unemployment Insurance Commission representatives in Ottawa who informed us it was quite different from any other they had previously approved.

Punched card procedures which could be operated on our equipment had not seemed practical if they made provision for compliance with all of the Government requirements. By devising a new approach to the weekly recording problem we have now been able to do this on a fully automatic basis using a maximum of five punched cards per year for each employee.

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One of these cards is a permanent master card showing the employee's name, unemployment insurance number, personnel number, etc. Then we have a card for each three-month period on which the deductions during that period are recorded each week. Two of the columns in the card are set aside for each week of the period and our reproducing punch is set to reproduce, into the proper column for the current week, the deductions as shown by punch-holes in the card from which the paycheque has been written. This weekly operation requires only a few minutes of machine time and proof is easy to obtain by running the cards through the tabulator.

Termination of an employee's services involves withdrawing his card, or cards, for the year-to-date and running them through the tabulator to imprint on a special form which shows, on four lines, the deductions for each week of his employment during the year.

At the end of the year all cards are run through the tabulator to imprint on to a report for each employee, and these reports are forwarded to the Unemployment Insurance office. It is not necessary to renew books each year.

Auditing of these records is simple for the Unemployment Insurance Auditors since the tabulator can be used to provide totals for any period, or by employee, which can be related to our ledgers or to our remittance.

Liability insurance is usually based on amount of payroll.

Pensions have been developing in most companies for a number of years. Some plans are relatively simple while others are extremely complicated. Guaranteed amounts of pensions, provisions for refunds, past service coverage, etc., may make necessary extra premium payments unless they are funded through purchase of paid-up annuities year by year. Pension plans tend to require a growing amount of clerical attention as they become older since an increasing number of settlements have to be made resulting from retirements, deaths, terminations, illness, leaves of absence, etc. Each employee's case seems to be a bit different from previous situations and requires careful attention for a pension settlement is a lifetime matter. Pension premiums may be related to earnings, to number of eligible employees, or to profits, or a combination of these. Hence, allocation of costs to particular operations is a bit tricky.

Group Insurance plans can create many problems as they develop. For one thing, they provide varying types of coverage, and the employees often have an option as to which items of protection they individually subscribe for. Then provision is usually made for dependents, and the ratio of dependents to employees can vary from year to year with resulting fluctuations in average insurance premium

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cost per employee. Group premium rates are also affected by the average ages of the insured and the ratio of female employees in the group.

Some Group Insurance is straight insurance, in some cases with provision for dividends. Other policies are on a "retention" basis whereby all premiums not absorbed by claims and a fixed "retention" percentage are refunded to the employer. Then, some plans are contributory, while others are fully paid by the employer.

It is easy for a negotiating group to agree to a minor change in insurance provisions which appears to be inconsequential but which gradually develops into a source of premium cost as well as clerical expense. Some samples we have encountered provide certain reduced benefits for pensioned employees providing they had carried this coverage for a specified period before retirement. Employees who have passed their twentieth anniversary receive some elements of their insurance (if previously carried by them) on a non-contributory basis. Insurance coverage is continued for varying periods for different elements of benefit when employees are on lay-off or sick leave or even certain other types of leaves of absence, in some cases requiring the employee to continue his contributions. Now these are all provisions for which a fairly good case can be made, especially those for pensioners and employees on lay-off. However, the number of pensioners and twenty-year employees tends to increase, with accompanying cost increases. Also, it becomes much more difficult to compute the cost of proposed changes in coverage. The lay-off arrangement is really tricky. An employee is ill for several weeks, or even months, then decides not to return but overlooks notifying us. A follow-up must be maintained even if collection is not required from the absent employee. And, if changes in benefits are arranged under the master contract, employees must be brought into line as they return to work. The resulting situations can give rise to much perplexity and frustration for insurance clerks.

Of course, it is obvious that the personnel department and foremen, etc. spend a great deal of time in connection with union negotiations, not to mention the lost time and efficiency of employee representatives. Some of this cost is measurable as it begins to involve full time people. Other elements are not measurable and, in fact, some would exist in another form even if there were no union.

Payroll preparation has become a costly operation. I can remember when one man acted as employment department, time-keeper, and payroll clerk, doing everything except actual typing of cheques for our payroll, which was then much smaller than today. In the ensuing fifteen years we have seen the advent of Income Tax deductions, Medical, Surgical, Hospital, and Weekly Indemnity Insurance deduc-

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tions, Community Chest deductions, Union Dues, all kinds of statistics and, sometimes, retroactive adjustment of selected rates. This requires some costly equipment rental and part time of three people and is charged to General Overhead expense.

I have spent considerable time in discussion of various items connected with employment which are, therefore, part of the cost for the efforts of men and women expended on our behalf in the production or distribution of goods and services. In other words, the cost of labour. In this recapitulation I have only listed items with which most of you are fully familiar and the recital will have served only to bring all factors together as a basis for analysis of our question as to whether our labour costs are really revealed or, at least partly, concealed.

Inter-Relation of Cost

At the outset of this article an illustration was given of how recorded cost of fringe benefits or indirect costs could be misleading if not sufficiently analyzed. Now let's give some thought to the other side of this question.

Most of us break our labour costs down into various categories such as Direct, Indirect, Mechanical, Supervisory, Clerical, etc., usually with a view to better measurement of efficiency since some are related directly to volume while others are relatively fixed in character. A good case can be made for most of the break-downs in use but we can also place too much reliance on some of the controls developed from these analyses.

So many of our costs are inter-related, and reductions in one group will produce increases in others. For instance, we frequently hear that the ratio of office employees to factory employees is increasing and that this reflects an increasing tendency for office management to fall behind factory management in development of modern techniques. Now this may be true in some instances but in many, many more it is not. As a matter of fact, when the factory, by automation, reduces the number of persons required for a given quantity of production, the amount of clerical work required for recording and control may actually be increased. The increasing pre-occupation of the Unions with employee security and job security also demands more clerical effort and Government regulations call for more and more records and reports. Now, if a reliable yardstick for measuring office output or productivity could be found, the result would probably reveal that the office is not far behind, if not ahead of, the factory in the matter of productivity.

I mentioned the interrelationship of various labour categories. Mechanical labour can be reduced by neglecting maintenance but this may raise productive labour costs. In our plant, the Carton Printing Department can be careless in handling its product with the result

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that the Packing Department encounters all kinds of lost time, etc. Proper training and indoctrination of new employees by the Personnel Department can reduce labour costs on the job; and an effective health and safety programme can also save labour cost. Very often a small extra expenditure in the office will provide controls which eliminate or prevent many times greater waste of labour in the factory—or arbitrary slashing of office staff can eliminate valuable controls and permit undue waste in the factory. Of course, I could reduce my office clerical labour costs considerably by further use of Punched Card machines if I could depend on our management to ignore the rental and card costs.

Conclusion

While it is important to determine what details are needed in recording and reporting facts, this is a two-way measurement. We have to avoid presenting details which are not needed lest in some instances, we actually mislead or at least confuse management by inconsequential data.

At the Annual Conference of our Canadian Society, one of the speakers dealt with the merits of measuring effectiveness on the basis of productivity or 'value added in manufacture'. Of course, he was thinking in terms of the VALUE of labour rather than its cost. However, measurement in terms of hours spent on each operation gives a better historical comparison of efficiency than dollar costs, which have been subject to rate changes. If we develop a satisfactory method of measuring daily productivity *per man hour* for each operation we should then be in a position to take a new look at presentation of labour costs.

I wonder if we could not analyze the various elements of cost which make up the real cost of an hour of work for a particular industry and find a means of handling it throughout our cost compilations and presentations so that labour in our unit costs is reflected as one total figure. We should then be furnishing our management with realistic information for labour negotiations and in consideration of new methods, equipment, etc.

This might be done in some cases by working out a rate per hour for indirect costs to be added to all labour figures—or a percentage of labour cost if this seems more directly related to the elements which give rise to the indirect costs, or perhaps a combination of both. This should not call for much, if any, extra work since these items would otherwise have to be spread as burden.

And, of course, a schedule of indirect costs pertaining to labour would be prepared in total to show the breakdown by elements, for it is important to control these as well as the hours.

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Having reached this point we have reduced the temptation to cut one labour cost at the expense of another.

But we may still bury a lot of labour costs in our overhead expense, labelling them salaries in our detailed schedules. For instance, many companies, including our own, operate their Purchasing and Traffic Departments as divisions of the office. In actual practice, however, these operations are concerned respectively with reduction of material and freight costs—both of which contribute to the Cost of Sales. Are they not then reasonable charges to our Cost of Sales under the heading of Labour? And as electronic computers become more available, data processing centres will be set up in the office to take over much of the control work now performed in both plant and office. Where will these people fit into your costs?

The problem of labour costs is not completely solved in our company as yet, but solution begins with the recognition of a problem and we have at least taken the first steps in this direction.

FOR FURTHER READING

ANALYSIS AND CONTROL OF FACTORY LABOUR COSTS, by H. C. Geisler, Cost and Management, April 1955.

HANDLING OF FRINGE COSTS AS DIRECT LABOUR, N.A.C.A. Bulletin, Section 1, November 1954.

ACCOUNTING FOR SUPPLEMENTAL LABOUR COSTS, by Neil K. Alexander, Cost and Management, February 1953.

PERSONALS

John R. Griner, R.I.A., has been appointed an Account Executive in the Toronto office of Merrill Lynch, Pierce, Fenner & Beane.

Lynn G. Clark, R.I.A., has been appointed Assistant Treasurer and Controller of Ex-Cell-O Corporation of Canada Limited, London, Ontario.

R. A. Lennox, a General member of the Bay of Quinte Chapter, has been appointed Secretary-Treasurer of Quinte Milk Products, Limited, Wellington, Ontario. Mr. Lennox was formerly with Stewart-Warner Corp. in Belleville.

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